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A Comparison of the Influence of Three Types of Illustrative Material and no Illustrative Material on Usage of Agricultural Extension Service Releases by South Dakota Weekly Newspapers

Gerald Lou Grotta

A COMPARISON OF THE INFLUENCE OF THREE TYPES OF ILLUSTRATIVE MATERIAL AND NO ILLUSTRATIVE MATERIAL ON USAGE OF AGRICULTURAL EXTENSION SERVICE RELEASES BY SOUTH DAKOTA WEEKLY NEWSPAPERS

BY

GERALD LOU GROTTA

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This thesis is approved as a creditable, independent investigation by a candidate for the degree, Master of Science, and acceptable as meeting the thesis requirements for this degree; but without implying that the conclusions reached by the candidate are necessarily the conclusions of the major department.

Thesis Advisor

Head of the Major Department

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G. L. G.

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INTRODUCTION

News releases compiled and distributed by an information service must appear in print if they are to convey the desired information to the public. This study was conducted to determine the influence of illustrative material on the use by South Dakota weekly newspapers of news releases of the Agricultural Extension Service at South Dakota State College.

The research was designed to compare, on the basis of usage, releases accompanied by the three most common forms of illustrative material (glossy photographs, mats, and plastic engravings) with the same releases when unaccompanied by illustrative material.

According to Lipscome (4):

> Pictures in the hometown paper are not necessarily "worth a thousand words," and they can require considerable time and effort--yet their attention-getting and story-telling values are such that they deserve reasonable consideration as an important part of your newspaper plan.

Marlow and Black (3) state, "Whenever possible, if the story warrants it, photographs make stories more appealing."

Yet, in spite of the "attention-getting and story-telling values" of pictures, Bollman and Richardson (2) found that from April 18 through May 9, 1959, the 134 non-competitive weekly newspapers in South Dakota devoted only 1.54 percent of their space to pictures. This is probably not due to a lack of interest in illustrative material, but more likely a lack of facilities, time, and capital to invest in equipment necessary for more extensive picture coverage.

The desire for more illustrative material by South Dakota weekly newspaper editors is substantiated in a study conducted by Sudlow (5). Of 86 editors replying to a questionnaire, 85.7 percent expressed a desire to receive more illustrative material with Agricultural Extension Service news releases. This agrees with the statement by Baus (1) that " . . . country editors who may disdain mimeographed handouts are relatively eager for good illustrative material."

One hypothesis tested in this study, then, was that an information service should obtain greater usage of news releases by including illustrative material with the news release. Another general hypothesis was that including a plastic engraving with a news release would increase usage of that release, since in general it is easier and less expensive for most weekly newspapers to use plastic engravings than other forms of illustrative material. In Sudlow's study, 61.5 percent of the editors expressed a preference for the plastic engravings while 32.5 percent listed mats and only 5.9 percent listed photographs.

Yet, it is considerably more expensive to purchase plastic engravings for mass distribution than to purchase mats or photographs. This study was designed primarily to compare the costs of these three forms of illustrative material, and a story sent without illustrative material, on the basis of cost per insertion, cost per column inch printed, and cost per subscriber. These are the important considerations because, regardless of initial cost, the effort and money are used wisely only when the material reaches the public by appearing in print.

PROCEDURE

All weekly newspapers in South Dakota were arranged, according to circulation, from largest to smallest.[1]

The influence of four variables--photographs, mats, plastic engravings,[2] and "no illustrative material"--on usage by South Dakota weekly newspapers of Agricultural Extension Service news releases was to be tested. Therefore, the newspapers were divided into four groups, designated A, B, C, and D.[3] The group to which each newspaper was to be assigned was determined by the following plan:

Largest newspaper in the state----Group A
Second largest newspaper----------Group B
Third largest newspaper-----------Group C
Fourth largest newspaper----------Group D
Fifth largest newspaper-----------Group B
Sixth largest newspaper-----------Group C
Seventh largest newspaper---------Group D
Eighth largest newspaper----------Group A
etc.

This system of assigning newspapers to the various groups (A,B,C, D; B,C,D,A; C,D,A,B; D,A,B,C; A,B,C,D, etc.) was used to prevent the largest newspaper in each group of four from falling into the A group and the smallest into the D group. It resulted in the following mean

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[1]Source of circulation data: 1958 South Dakota Newspaper Directory, South Dakota Press Association, Brookings, South Dakota. Where two newspapers were owned by the same publisher, the smaller newspaper was excluded.

[2]In this study, the term "plastic engraving" refers to engravings made on "Scan-A-Plate" by a Fairchild "Scan-A-Graver."

[3]The complete list of newspapers and method of assigning newspapers to the four groups are shown in Appendix I.

and median circulations, by group:

	Median Circulation	Mean Circulation
Group A--------	848	1,086
Group B--------	832	1,085
Group C--------	852	1,069
Group D--------	850	1,064

In addition, the groups were plotted on a map of South Dakota to determine if geographical distribution of each group was fairly representative of the entire state (see Figure 1).

The geographical distribution of the groups, by quarters of the state, was:

Upper Left Quarter	Upper Right Quarter
Group A--2	Group A--16
Group B--6	Group B--10
Group C--4	Group C--15
Group D--5	Group D--10

Lower Left Quarter	Lower Right Quarter
Group A--4	Group A--15
Group B--6	Group B--15
Group C--3	Group C--15
Group D--5	Group D--17

The distribution of newspapers in the state in this manner is a result of population distribution, with population density highest in the southeast, or lower right quarter, of the state and lowest in the western, or left, half of the state.

On the basis of circulation and geographical distribution, the author feels that each group is adequately representative of the entire state's weekly newspaper field for projections made in the section on usage in the results of the study.

The four groups, A, B, C, and D, are shown in Tables I, II, III, and IV, respectively.

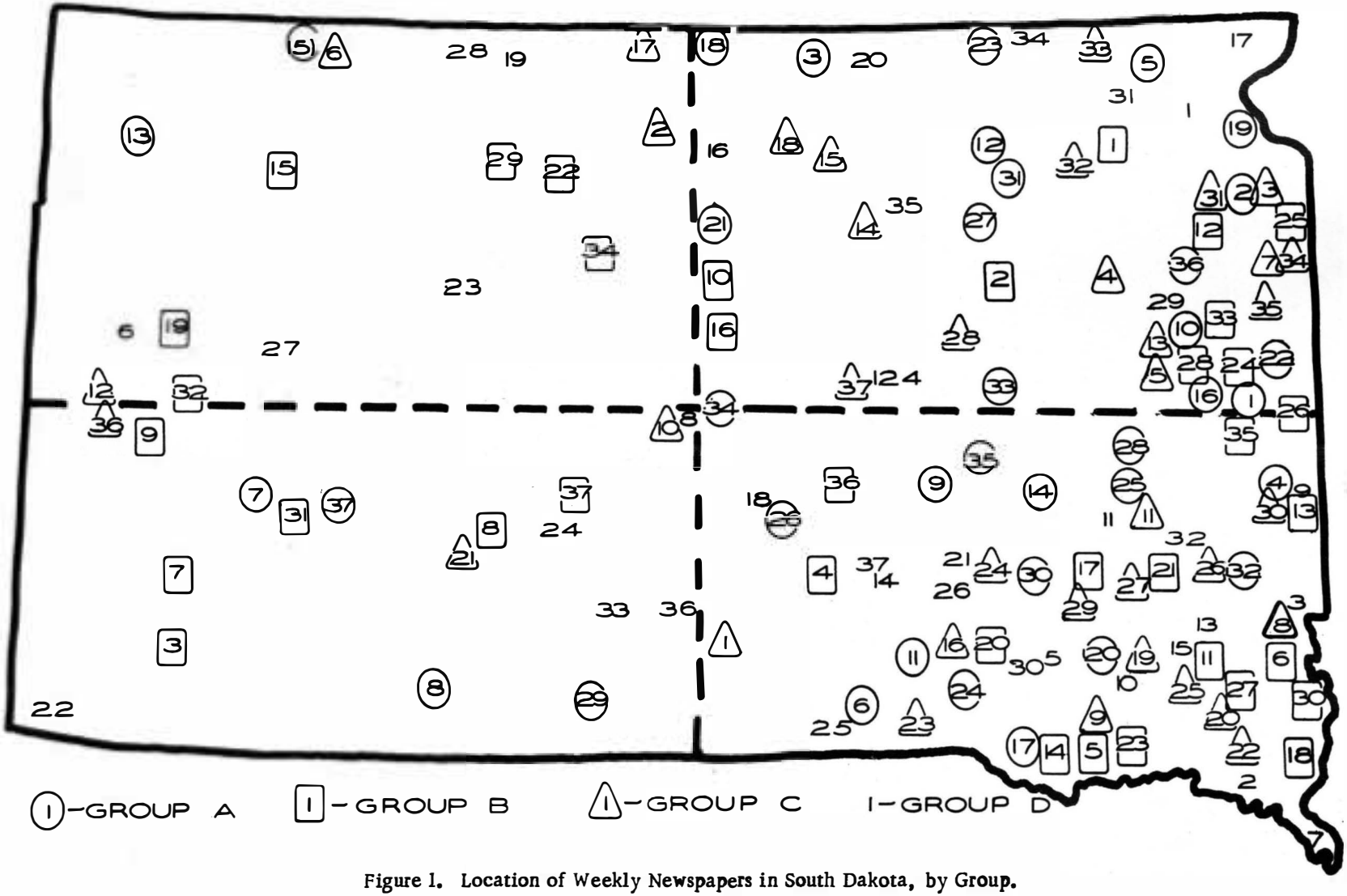

Figure 1. Location of Weekly Newspapers in South Dakota, by Group.

TABLE I. NEWSPAPERS IN GROUP A

Number*	City	Newspaper	Circulation**
1.	Brookings	Register	4,039
2.	Milbank	Grant County Review	2,635
3.	Eureka	Northwest Blade	2,187
4.	Flandreau	Moody County Enterprise	2,107
5.	Britton	Journal	1,992
6.	Gregory	Times-Advocate	1,737
7.	Rapid City	Gate City Guide	1,629
8.	Martin	Bennett County Booster II	1,514
9.	Wessington Springs	Independent	1,475
10.	Hayti	Herald-Independent	1,315
11.	Platte	Enterprise	1,251
12.	Groton	Independent	1,194
13.	Buffalo	Times-Herald	1,170
14.	Woonsocket	News	1,055
15.	Lemmon	Tribune	1,025
16.	Arlington	Sun	1,005
17.	Lake Andes	Wave	950
18.	Herried	Prairie Picayune	853
19.	Wilmot	Enterprise	848
20.	Menno	Hutchinson Herald	830
21.	Hoven	Review	760
22.	White	Leader	732
23.	Frederick	Brown County News	720
24.	Geddes	Charles Mix County News	695
25.	Canova	Herald	649
26.	Kennebeck	Advocate-Leader	614
27.	Doland	Times-Record	600
28.	Carthage	News	594
29.	Mission	Todd County News	578
30.	Mt. Vernon	News	521
31.	Conde	News	500
32.	Hartford	News	495
33.	Wolsey	News	475
34.	Harrold	Journal	452
35.	Alpena	Journal	380
36.	Henry	Independent	350
37.	Quinn	Record	245
		Total Circulation	40,171

Mean Circulation------1,086
Median Circulation--- 848

*Refers to number on map, Figure 1.
**From 1958 South Dakota Newspaper Directory, South Dakota Press Association, Brookings, South Dakota.

TABLE II. NEWSPAPERS IN GROUP B

Number*	City	Newspaper	Circulation**
1.	Webster	Reporter & Farmer	3,743
2.	Redfield	Press	2,963
3.	Hot Springs	Star	2,160
4.	Chamberlain	Register	2,063
5.	Tyndall	Tribune & Register	1,911
6.	Beresford	Republic	1,840
7.	Custer	Custer County Chronicle	1,580
8.	Philip	Pioneer Review	1,510
9.	Sturgis	Tribune	1,471
10.	Gettysburg	Potter County News	1,405
11.	Parker	New Era	1,250
12.	Watertown	Photo News	1,190
13.	Garretson	News	1,151
14.	Wagner	Post	1,115
15.	Bison	Courier	1,023
16.	Onida	Watchman	1,003
17.	Alexandria	Herald	947
18.	Alcester	Union	901
19.	Newell	Valley Irrigator	832
20.	Armour	Chronicle	807
21.	Canistota	Clipper	753
22.	Timber Lake	Topic	740
23.	Springfield	Times	704
24.	Volga	Tribune	653
25.	Revillo	Weekly Item	648
26.	Elkton	Record	635
27.	Hurley	Leader	600
28.	Estelline	Journal	590
29.	Isabel	Dakotan	575
30.	Hudson	Hudsonite	525
31.	Wall	Courant	500
32.	Sturgis	Black Hills Press	489
33.	Castlewood	Hamlin County Republican	471
34.	Eagle Butte	News	460
35.	Coleman	Argus	380
36.	Gann Valley	Chief	323
37.	Draper	Jones County Tribune	282
		Total Circulation	40,151

Mean Circulation------1,085
Median Circulation---- 832

*Refers to number on map, Figure 1.
**From 1958 South Dakota Newspaper Directory, South Dakota Press Association, Brookings, South Dakota.

TABLE III. NEWSPAPERS IN GROUP C

Number*	City	Newspaper	Circulation**
1.	Winner	Advocate	3,185
2.	Mobridge	Tribune	2,844
3.	Milbank	Herald Advance	2,450
4.	Clark	Clark County Courier	2,022
5.	DeSmet	News	1,846
6.	Lemmon	Leader	1,792
7.	Clear Lake	Courier	1,665
8.	Lennox	Independent	1,475
9.	Scotland	Journal	1,438
10.	Fort Pierre	Times	1,380
11.	Salem	Special	1,293
12.	Spearfish	Queen City Mail	1,185
13.	Lake Preston	Times	1,116
14.	Faulkton	Record	1,102
15.	Ipswich	Tribune	1,048
16.	Corsica	Globe	990
17.	Pollock	Pioneer	905
18.	Bowdle	Pioneer	875
19.	Tripp	Ledger	852
20.	Irene	Tri-County News	780
21.	Kadoka	Press	750
22.	Wakonda	Monitor	740
23.	Bonesteel	Enterprise	725
24.	Mitchell	Davison County Tribune	651
25.	Viborg	Enterprise	649
26.	Humbolt	Journal	631
27.	Bridgewater	Tribune	608
28.	Wessington	Times-Enterprise	582
29.	Emery	Enterprise	554
30.	Colton	Courier	523
31.	South Shore	Gazette	514
32.	Waubay	Clipper	486
33.	Langford	Bugle	465
34.	Gary	Interstate	460
35.	Toronto	Herald	425
36.	Deadwood	Black Hills Weekly	314
37.	Ree Heights	Review	225
		Total Circulation	39,542

Mean Circulation------1,069
Median Circulation---- 852

*Refers to number on map, Figure 1.

**From 1958 South Dakota Newspaper Directory, South Dakota Press Association, Brookings, South Dakota.

TABLE IV. NEWSPAPERS IN GROUP D

Number*	City	Newspaper	Circulation**
1.	Sisseton	Courier	3,017
2.	Vermillion	Plain Talk	2,760
3.	Canton	Sioux Valley News	2,403
4.	Miller	Press	2,144
5.	Freeman	Courier	1,842
6.	Belle Fourche	Bee	1,757
7.	Elk Point	Leader-Courier	1,645
8.	Pierre	Capital Journal	1,570
9.	Dell Rapids	Tribune	1,422
10.	Parkston	Advance	1,336
11.	Howard	Miner County Pioneer	1,280
12.	Highmore	Herald	1,196
13.	Marion	Record	1,115
14.	Kimball	Brule County News	1,073
15.	Centerville	Journal	1,025
16.	Selby	Record	1,008
17.	Rosholt	Review	905
18.	Presho	Lyman County Herald	860
19.	McLaughlin	Messenger	850
20.	Leola	Herald	830
21.	Plankinton	South Dakota Mail	750
22.	Edgemont	Tribune	733
23.	Dupree	West River Progress	725
24.	Murdo	Coyote	700
25.	Burke	Gazette	645
26.	Stickney	Argus	625
27.	Faith	Independent	601
28.	McIntosh	Corson County News	600
29.	Bryant	Hamlin County News	528
30.	Delmont	Record	521
31.	Bristol	New Era	506
32.	Montrose	Herald	496
33.	White River	Mellette County News	465
34.	Hecla	Journal	453
35.	Crawford	Beacon	399
36.	Wood	Pioneer	379
37.	Puckwana	Press-Reporter	220
		Total Circulation	39,384

Mean Circulation------1,064
Median Circulation---- 880

*Refers to number on map, Figure 1.
**From 1958 South Dakota Newspaper Directory, South Dakota Press Association, Brookings, South Dakota.

Two news releases were used to obtain data for this study. Both releases were chosen because of their state-wide interest, to prevent regional interest from influencing results. The first news release, sent January 30, 1958, contained recommendations for preventing tree seedling loss from root freezing. Farmers and ranchers in all parts of South Dakota are interested in trees, whether they are used for shelterbelts and windbreaks or beautification and shade around the home. The first news release is shown in Appendix II. The second news release, sent July 24, 1958, concerned a steer that made an unusually large rate of gain in a feeding trial conducted at the Agricultural Experiment Station, South Dakota State College, Brookings. Livestock is the largest single source of agricultural income in South Dakota and cattle are raised in every section of the state. The second news release is shown in Appendix III.

Mediocre illustrations (as defined by the author on the basis of composition and technical qualities) were used in both mailings, so that the form of illustrative material and not the content of the illustration would be the major factor in the newspapers' decision to use or reject the test releases. The illustrations used in this study are shown in Appendices II and III, with the releases they accompanied.

For the first release, four slips of paper were lettered "A", "B", "C", and "D" and placed in a box. They were drawn one at a time, with the first being assigned to "no illustrative material"; the second, photographs; the third, mats; and the fourth, plastic engravings. This resulted in Group A receiving "no illustrative material"; Group B,

photographs; Group C, plastic engravings; and Group D, mats.

To determine which group would receive each form of illustrative materials for the second news release, slips of paper were numbered "1", "2", and "3" and placed in a box. The number on the slip drawn indicated the number of moves forward to be made in the type of illustrative material assigned to the groups. Number 2 was drawn so the illustrative materials were moved up two groups, resulting in Group A receiving plastic engravings; Group B, mats; Group C, "no illustrative material"; and Group D, photographs.

Both test releases were sent to weekly newspapers in standard envelopes used in mailing Agricultural Extension Service news release packets to South Dakota weekly newspapers. There was no indication that the news release packets containing the test releases were any different than the usual news release packets sent each week. The test releases were on the second sheet in both news release packets containing the test releases.

Costs of preparing the test releases and illustrative materials were computed for use in comparing the various illustrative materials on the basis of value received for dollar spent. Costs are shown in Table V, and apply to both test releases as length of story and size of illustration are about equal in both cases. All costs are estimations made by the author, based on available cost data as indicated in Table V.

Results on the usage phase of the study were obtained from clippings furnished by the South Dakota Press Service.

TABLE V. ESTIMATED COSTS FOR PREPARING TEST RELEASES AND COSTS OF ILLUSTRATIVE MATERIALS, BY GROUP

Item	Group			
	No Illustrative Material	Photographs	Mats	Plastic Engravings
Time with source (1 hr. @ $2.33/hr.)	$2.33	$2.33	$2.33	$2.33
Time writing story (2½ hrs. @ $2.33/hr.)	5.83	5.83	5.83	5.83
Mimeographing Costs*	3.70	3.70	3.70	3.70
Time taking picture (3/4 hr. @ $2.33/hr.)	----	1.74	1.74	1.74
Film (4 ss. @ $0.15 ss.)**	----	.60	.60	.60
Processing (4 ss. @ $0.15 ss.)**	----	.60	.60	.60
Two-Column Glossy Photographs** (37 prints @ $0.20)	----	7.40	----	----
Two-Column Glossy Photograph** (1 print @ $0.20)	----	----	.20	.20
Engraving***	----	----	3.91	----
Mats (37 @ $0.30)***	----	----	11.10	----
Plastic engravings**** (37 @ $1.20)	----	----	----	45.14
Total Cost, by group	$11.86	$22.20	$30.01	$60.14

*Franklin Estimating Book.
**South Dakota State College Photography Laboratory.
***McNitts, Inc., Cleveland, Ohio.
****Estimated (based on rate charged by Brookings Register).

RESULTS

Data from both releases are combined for analysis, with all statistical tests based on mean figures.

Six comparisons tested for statistical significance are:

Usage by Newspapers	1. Total Number of Insertions
	2. Total Inches Printed
	3. Total Circulation of Newspapers Using Releases
Costs to Institution	4. Cost Per Insertion
	5. Cost Per Published Inch
	6. Cost Per Subscriber

Insertions by size of newspaper and time lag between receipt of the releases by newspapers and dates of publication of the test releases are also included under the section on usage.

Least Significant Difference is the statistical test used in this study. The figure designated as Least Significant Difference is the minimum by which two groups must differ before it can be said that weekly newspapers in South Dakota will discriminate between the two forms of illustrative material. The Least Significant Difference is often written as equal to the product of the standard error of the mean, the $\sqrt{2}$, and the value of t at the 5 percent level for the number of degrees of freedom, f, associated with the standard error of the mean. Therefore, all statistical results are at the 5 percent confidence level. The complete formulae used in this study are presented in Appendix IV.

Data for two newspapers in the group receiving "no illustrative material" with the second release, and for one newspaper receiving a photograph with the first release, have been omitted. In the first

case, both newspapers also used the illustration. Investigation revealed that one newspaper, printed offset, had copied the illustration from another newspaper and the second had borrowed it from a neighboring newspaper. In the second case, the newspaper omitted had borrowed the type and illustrative material from a neighboring newspaper. Because the type of illustrative material received with the release did not seem to be the determining factor in the decision to print the release, these data were not included in the analysis.

Usage

Total Number of Insertions

The hypothesis tested, stated in its null form, was: Form of illustrative material will not have a significant effect on number of insertions of the test releases.

Insertions by group are shown in Table VI and Figure 2.

The table reveals that results for both releases were consistent, i. e., plastic engravings ranking first in both releases; mats, second; no illustrative material, third; and photographs, fourth.

On the basis of statistical analysis (see Table VI), the null hypothesis must be rejected. It can be stated, at the 5 percent significance level, that the greater number of insertions of the test releases by newspapers receiving plastic engravings was not due to chance alone and that it is likely that the plastic engravings were responsible for the greater number of insertions. Also, the number of insertions of the test releases by newspapers receiving mats was

TABLE VI. NUMBER OF INSERTIONS OF TEST RELEASES, BY GROUP

Group	First Release	Second Release	Mean
No illustrative material	3	4	3.5
Photographs	1	3	2
Mats	4	5	4.5
Plastic engravings	15	18	16.5
Least Significant Difference			2.2

significantly higher than the number of insertions of the test releases by newspapers receiving photographs.

To determine if the test releases were similar to the average Agricultural Extension Service new release on the basis of number of insertions, usage was compared to the average of all releases sent in 1957 and the average of all agricultural news releases sent in 1957.

Groups receiving "no illustrative material," photographs, and mats all fell close to the averages for 1957 releases. Averages for the 1957 releases were--All Releases, 12; Agricultural Releases, 14. Multiplying mean insertions in the group that received "no illustrative material" by four (since each group comprised a fourth of the weekly newspapers in the state) results in 14 insertions. The same computation for the group receiving photographs results in eight insertions and for the group receiving mats, 18 insertions.

However, when the mean number of insertions by the group receiving plastic engravings is multiplied by four, the result is 68 insertions. Only one release out of 450 sent to weekly newspapers by the Agricultural Extension Service in 1957 exceeded the usage of the two test releases accompanied by plastic engravings, when the .25 sample is expanded to include all newspapers in the state.

Total Inches Printed

The hypothesis tested, stated in its null form, was: Form of illustrative material will not have a significant effect on number of inches of test releases appearing in print.

Number of inches printed are shown in Table VII and Figure 3.

TABLE VII. COMPARISON OF TOTAL NUMBER OF INCHES PRINTED, BY GROUP

Group	First Release	Second Release	Mean
No illustrative material	27	34	30.5
Photographs	8.5	33	20.8
Mats	45	69	57
Plastic engravings	256	257	256.5
Least Significant Difference			26.9

Statistical analysis presented in Table VII requires that the null hypothesis be rejected. It can be stated, at the 5 percent significance level, that the greater number of inches of test releases

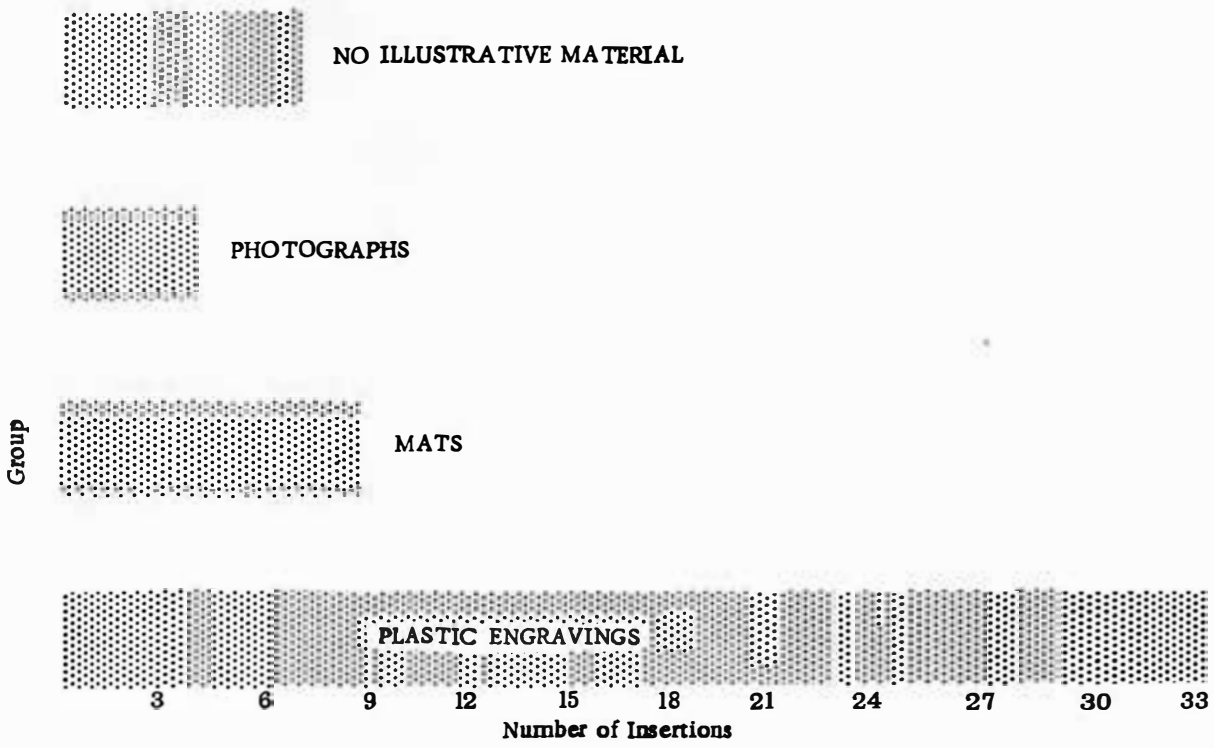

Figure 2. Number of Insertions of Test Releases, by Group.

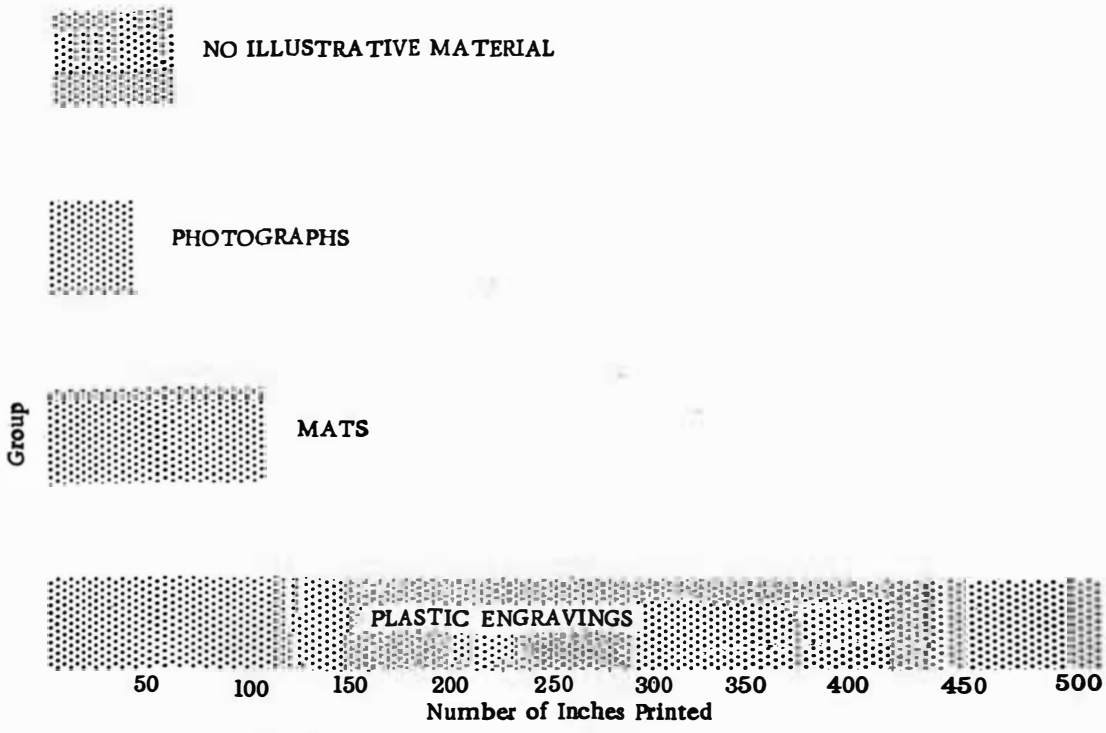

Figure 3. Number of Inches of Test Releases Printed, by Group.

appearing in newspapers in the group receiving plastic engravings was not due to chance alone and that it is likely that plastic engravings were responsible for the greater number of inches printed.

Total Number of Newspaper Copies in Which Test Releases Were Printed

The hypothesis tested, stated in its null form, was: Total number of newspaper copies in which test releases were printed will not be significantly different between groups as a result of the form of illustrative material.

Total number of newspaper copies in which test releases were printed, by group, is shown in Table VIII and Figure 4.

TABLE VIII. COMPARISON OF TOTAL NUMBER OF NEWSPAPER COPIES IN WHICH TEST RELEASES WERE PRINTED, BY GROUP

Group	First release	Second release	Mean
No illustrative material	3,986	4,145	4,065.5
Photographs	832	2,245	1,543
Mats	3,014	4,015	3,514.5
Plastic engravings	20,027	24,626	22,326.5
Least Significant Difference			11,137

Statistical analysis (see Table VIII) again requires that the null hypothesis be rejected. It can be stated, at the 5 percent significance level, that the greater total number of newspaper copies in which the

test releases accompanied by plastic engravings were printed was not due to chance alone and it is likely that the plastic engravings were responsible for the greater number of copies.

Usage of Test Releases by Circulation Size of Newspapers

Table IX shows usage of the test releases in each group by circulation size of newspapers. The data are presented graphically in Figure 5. Classification by circulation was set as follows:

Class 1 -- 0-580
Class 2 -- 581-830
Class 3 -- 831-1260
Class 4 -- 1261-and over

This classification resulted in nine newspapers from each group in Class 1, nine in Class 2, nine in Class 3, and ten in Class 4; or 18, 18, 18, and 20 for the two releases combined. Test releases accompanied by plastic engravings appeared in all four size classes, while test releases in the other three groups appeared in three classes each.

TABLE IX. COMBINED USAGE OF TEST RELEASES BY CIRCULATION SIZE OF NEWSPAPER, BY GROUP

Group	Class 1	Class 2	Class 3	Class 4
No illustrative material	1	---	3	3
Photographs	2	---	1	1
Mats	2	4	3	---
Plastic engravings	4	7	7	15

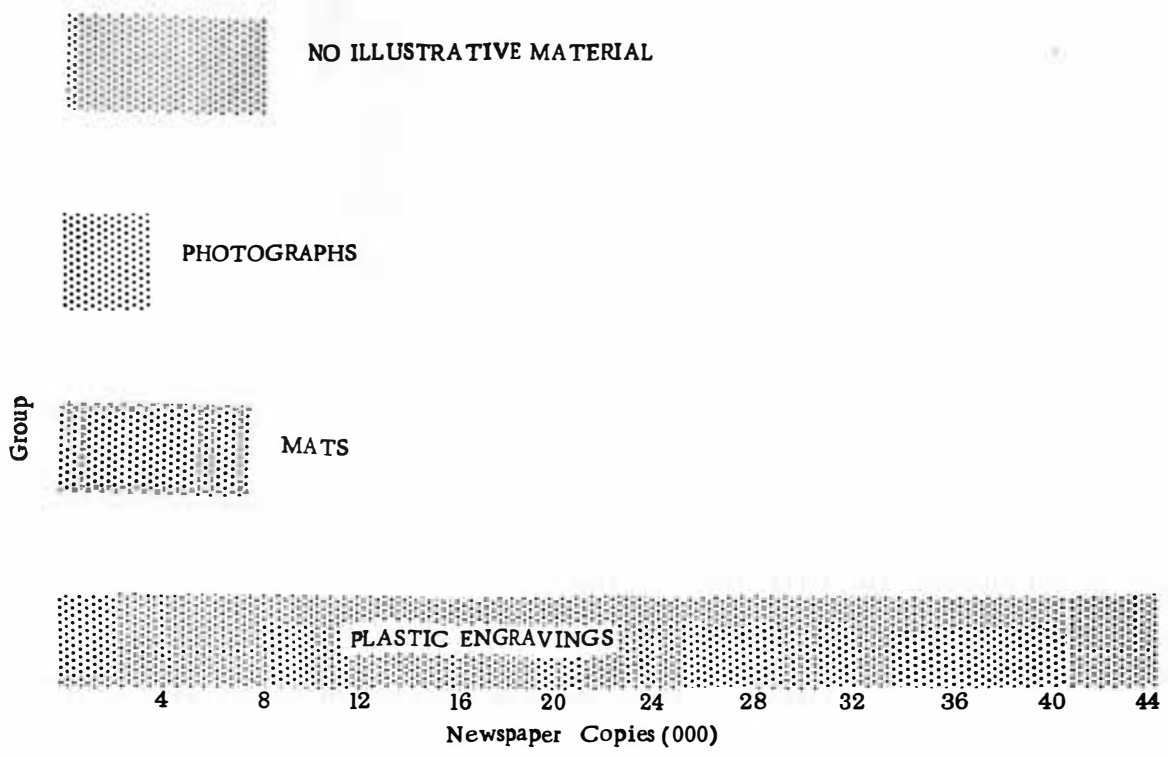

Figure 4. Total Number of Newspaper Copies in which Test Releases were Printed, by Group.

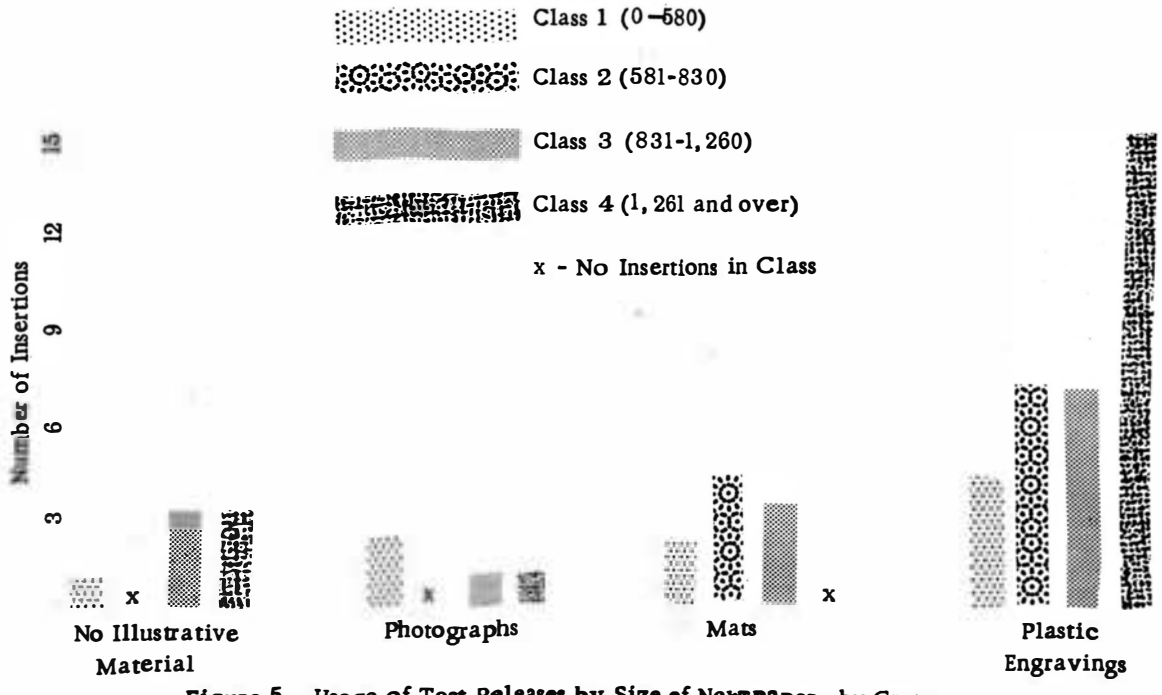

Figure 5. Usage of Test Releases by Size of Newspaper, by Group.

Time Between Receipt of Test Releases by Newspapers and Dates of Publication of Test Releases

These data are presented in Table X and Figure 6. Test releases not accompanied by illustrative material appeared the first, third, and fourth weeks after receipt by newspapers. Test releases accompanied by photographs appeared the first, second, and third weeks after receipt. In the group of test releases accompanied by mats, the test releases appeared the first, second, third, and fifth weeks after receipt. Test releases accompanied by plastic engravings appeared each week for six weeks following receipt by newspapers.

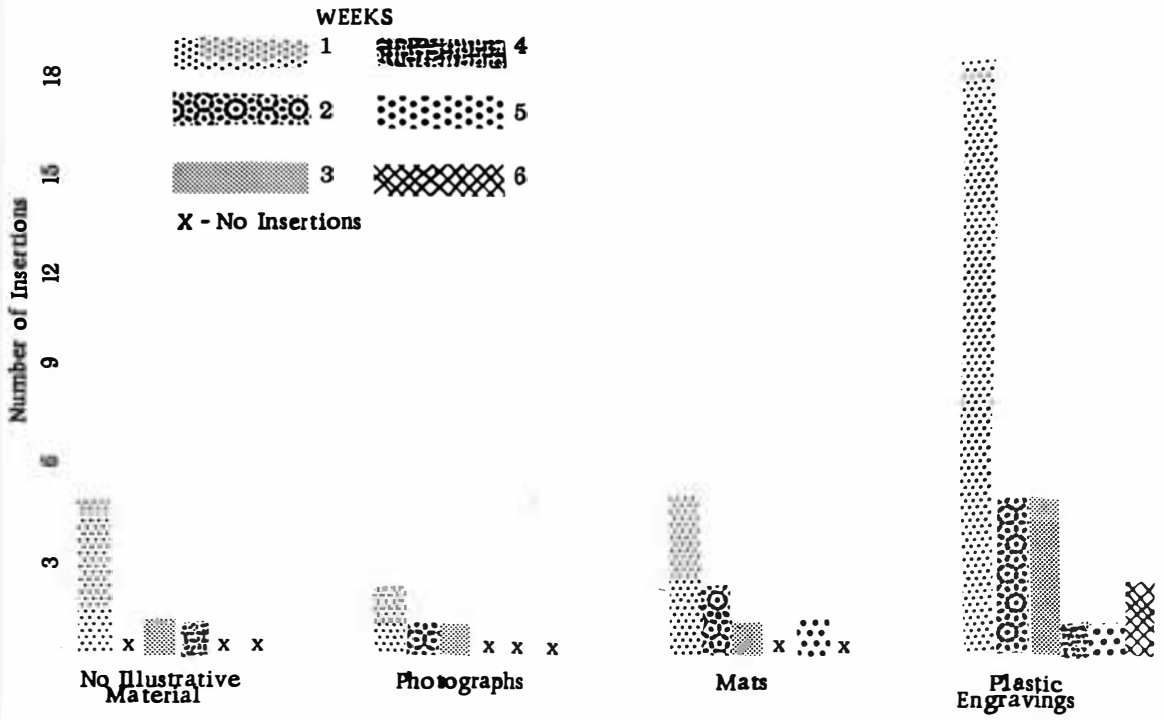

Figure 6. Time Between Receipt of Test Releases by Newspapers and Dates of Publication of Test Releases, by Group.

TABLE X. TIME BETWEEN RECEIPT OF TEST RELEASES BY NEWSPAPERS AND DATES OF PUBLICATION, BY GROUP

Group	Weeks between receipt and use					
	1	2	3	4	5	6
No illustrative material	5	---	1	1	---	---
Photographs	2	1	1	---	---	---
Mats	5	2	1	---	1	---
Plastic engravings	19	5	5	1	1	2

Costs

Cost Per Insertion

The hypothesis tested, stated in its null form, was: Cost per insertion of test releases, by group, will not be related to number of insertions (see Table VI) but will rank in the same order as total cost per group (see Table V).

Costs per insertion are shown in Table XI and Figure 7.

The null hypothesis must be rejected, according to the statistical analysis presented in Table XI. The table reveals that costs per insertion for the group receiving plastic engravings was actually lower than for the groups receiving the other two forms of illustrative material and only slightly higher than for the group which did not receive illustrative material with the test releases. It can be stated, at the 5 percent significance level, that the significantly greater number of insertions of the test releases in the group of newspapers

TABLE XI. COMPARISON OF COSTS PER INSERTION, BY GROUP

Group	First release	Second release	Mean
No illustrative material	$ 3.95	$ 2.97	$ 3.46
Photographs	22.20	7.40	14.80
Mats	7.50	6.00	6.75
Plastic engravings	4.01	3.34	3.67
Least Significant Difference			$15.50

receiving plastic engravings appeared to be substantial enough to offset the higher original cost of including plastic engravings with the test releases, when compared on the basis of cost per insertion. The same relationship between original cost and cost per insertion is indicated for mats, while the difference in cost per insertion approaches statistical significance in the case of photographs.

Cost Per Published Inch

The hypothesis tested, stated in its null form, was: Cost per published inch of test releases, by group, will not be related to total number of inches of test releases printed (see Table VII) but will rank in the same order as total original cost per group (see Table V).

Costs per published inch are presented in Table XII and Figure 8. Statistical analysis presented in Table XII requires that the

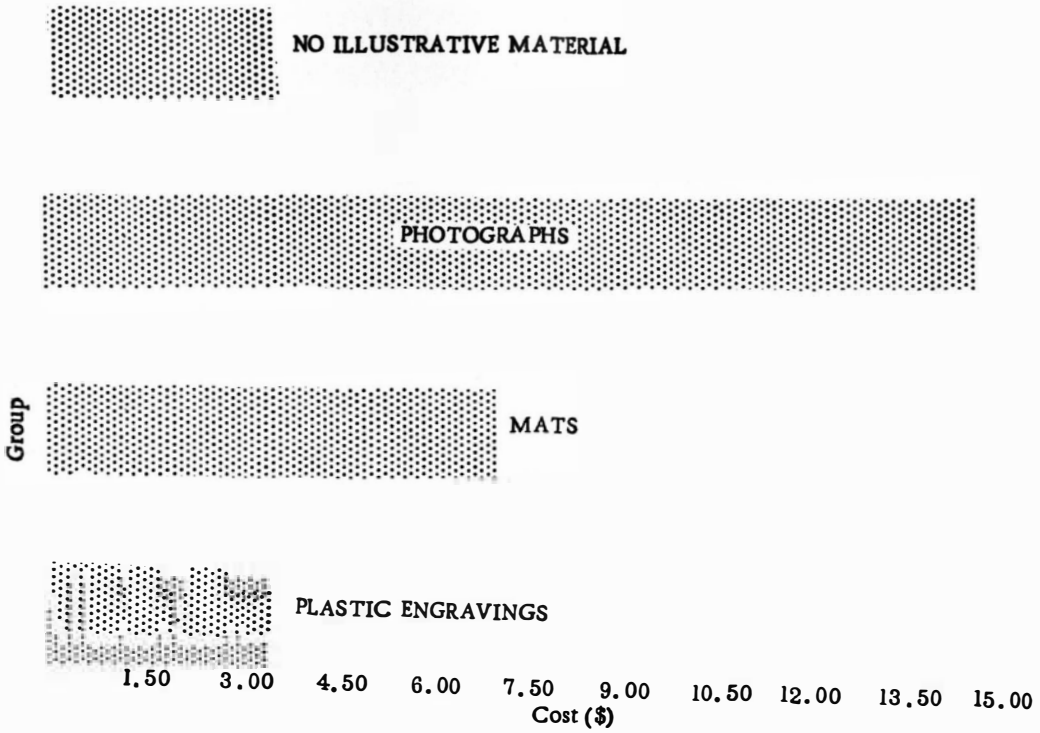

Figure 7. Costs per Insertion of Test Releases, by Group.

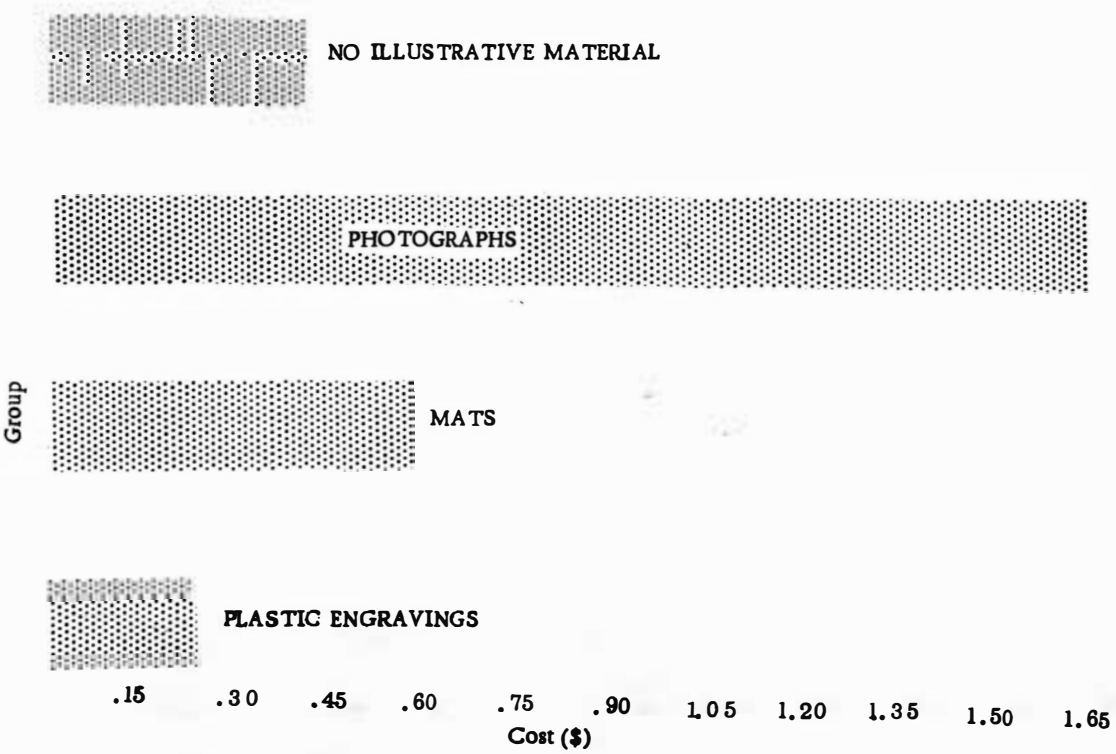

Figure 8. Costs per Published Inch of Test Releases, by Group.

TABLE XII. COMPARISON OF COSTS PER PUBLISHED INCH, BY GROUP

Group	First release	Second release	Mean
No illustrative material	$0.44	$0.35	$0.40
Photographs	2.61	0.67	1.64
Mats	0.67	0.44	0.56
Plastic engravings	0.23	0.23	0.23
Least Significant Difference			$2.07

null hypothesis be rejected. Cost per published inch is actually lower for the group receiving plastic engravings than for the other three groups, although the difference does not attain statistical significance. It can be stated, however, that at the 5 percent level of significance, the significantly greater total of published inches of the test releases in the group of newspapers receiving plastic engravings appeared to be substantial enough to offset the higher original cost of including plastic engravings with the test releases, when compared on the basis of cost per published inch.

Cost Per Newspaper Copy in Which Test Releases Were Printed

The hypothesis tested, stated in its null form, was: Cost per newspaper copy in which test releases were printed, by group, will not be related to the total number of newspaper copies in which test releases were printed (see Table VIII) but will rank in the same order

as total original cost per group (see Table V).

Cost per newspaper copy in which test releases were printed are presented in Table XIII and Figure 9.

TABLE XIII. COMPARISON OF COSTS PER NEWSPAPER COPY IN WHICH TEST RELEASES WERE PRINTED, BY GROUP

Group	First release	Second release	Mean
No illustrative material	$0.003	$0.003	$0.003
Photographs	0.027	0.010	0.019
Mats	0.010	0.007	0.009
Plastic engravings	0.003	0.002	0.003
Least Significant Difference			$0.014

On the basis of statistical analysis presented in Table XIII, the null hypothesis must be rejected. In this comparison, costs for the group receiving plastic engravings were lower than for the groups receiving photographs and mats and equal to that for the group which did not receive illustrative material. In fact, the difference between groups receiving plastic engravings and "no illustrative material" and the group receiving photographs reaches significance. It can be stated, at the 5 percent level of significance, that the significantly greater number of newspaper copies in which the test releases accompanied by plastic engravings were printed appeared to be substantial enough to

offset the higher original cost of including plastic engravings with test releases, when compared on the basis of cost per newspaper copy in which test releases were printed.

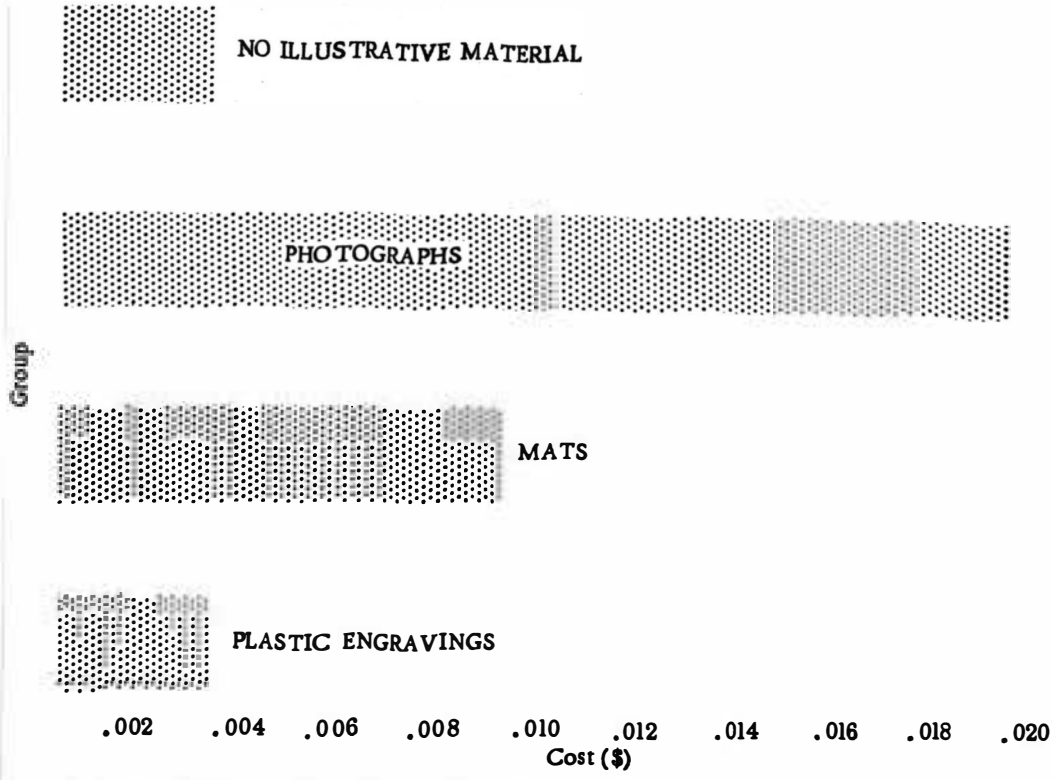

Figure 9. Costs per Newspaper Copy in which Test Releases were Printed, by Group.

SUMMARY

Usage of two news releases sent by the Agricultural Extension Service at South Dakota State College to weekly newspapers in South Dakota was significantly increased by including plastic engravings with the releases, as compared with the usage totals when the same releases were accompanied by photographs or mats or when no illustrative material was included.

Results were consistent through all three comparisons: i.e., the group of newspapers receiving plastic engravings ranked first in total number of insertions, total column inches printed, and total number of newspaper copies in which the test releases were printed. In all three comparisons, the differences showed a high degree of significance. Releases accompanied by photographs ranked lowest in all three comparisons; those accompanied by mats ranked second in total number of insertions and total number of inches printed and third in total number of newspaper copies in which the test releases were printed; those not accompanied by illustrative material ranked second in total number of newspaper copies in which the test releases were printed and third in total number of insertions and total number of inches printed.

Significantly greater usage of test releases by newspapers receiving plastic engravings was substantial enough to offset the higher original cost of including plastic engravings with the releases, when compared on the basis of cost per insertion, cost per published inch, and cost per newspaper copy in which the test release was printed.

In fact, in almost every case the costs were actually lower for the group of newspapers which received plastic engravings with the test releases. The difference, however, did not reach statistical significance at the 5 percent level of confidence in most cases. Again, in all three comparisons, releases accompanied by photographs rated at the bottom.

Plastic engravings appeared to have universal appeal in this study, regardless of size of newspaper (as measured by circulation). Only releases accompanied by plastic engravings appeared in all four size classes, while the other three groups of test releases appeared in three size classes each. In the size class containing the weekly newspapers with the largest circulations, releases accompanied by plastic engravings were used in 15 cases out of a possible 20, while releases accompanied by photographs were used in 1 case and releases not accompanied by illustrative material were used in 3 cases. No newspaper in the size class which included the newspapers with the largest circulations used the test releases accompanied by mats. Releases accompanied by plastic engravings were used by more newspapers in each size class than releases in any of the other three groups.

In this study, weekly newspapers in South Dakota also were apparently more reluctant to discard plastic engravings than mats or photographs. Six weeks after the test releases were mailed, releases accompanied by plastic engravings appeared in two newspapers, while five weeks was the longest period after receipt that any newspaper in the group receiving mats used the test releases. Test releases stopped

appearing in the group of newspapers not receiving illustrative material after four weeks and in the group receiving photographs, after three weeks.

TENTATIVE RECOMMENDATIONS

If an information service desires optimum usage of a news release in weekly newspapers, either because the information in the release is of vital importance to the people of the state or because the information service desires wide coverage for public relations purposes, sending plastic engravings with the release will result in significantly greater usage than will including mats or photographs or sending the release with no illustrative material.

Results of this study indicate that including photographs with news releases to weekly newspapers is a doubtful practice. Test releases accompanied by photographs ranked lowest in all three usage comparisons and highest in all three cost comparisons. As a possible explanation for this, the author offers the hypothesis that weekly newspaper editors are reluctant to purchase engravings for non-local photographs. Therefore, they are likely to "kill" the whole release rather than to use the release without the accompanying photograph.

The study also indicates that including mats with news releases sent to weekly newspapers will increase usage over news releases sent with no illustrative material, although this was not significant at the 5 percent level of confidence in this study.

In conclusion, the author feels that this study indicates that an information service should consider integrating the use of plastic engravings in its news and information programs to increase effectiveness of the programs when dealing with weekly newspapers.

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APPENDICES

APPENDIX I

How newspapers were divided into four groups:

Group	City and Newspaper	Circulation
A	Brookings Register	4,039
B	Webster Reporter & Farmer	3,743
C	Winner Advocate[1]	3,185
D	Sisseton Courier	3,017
B	Redfield Press	2,963
C	Mobridge Tribune	2,844
D	Vermillion Plain Talk	2,760
A	Grant County Review (Milbank)	2,635
C	Milbank Herald Advance	2,450
D	Sioux Valley News (Canton)	2,403
A	Northwest Blade (Eureka)	2,187
B	Hot Springs Star	2,160
D	Miller Press	2,144
A	Moody County Enterprise (Flandreau)	2,107
B	Chamberlain Register	2,063
C	Clark County Courier (Clark)	2,022
A	Britton Journal	1,992
B	Tyndall Tribune & Register	1,911
C	DeSmet News	1,846
D	Freeman Courier	1,842
B	Beresford Republic	1,840
C	Lemmon Leader	1,792
D	Belle Fourche Bee	1,757
A	Gregory Times-Advocate	1,737
C	Clear Lake Courier	1,665
D	Elk Point Leader-Courier	1,645
A	Gate City Guide (Rapid City)	1,629
B	Custer County Chronicle (Custer)	1,580
D	Pierre Capital Journal	1,570
A	Bennett County Booster II (Martin)	1,514
B	Philip Pioneer Review	1,510
C	Lennox Independent	1,475

A	Wessington Springs Independent	1,475
B	Sturgis Tribune	1,471
C	Scotland Journal	1,438
D	Dell Rapids Tribune	1,422
B	Potter County News (Gettysburg)	1,405
C	Fort Pierre Times	1,380
D	Parkston Advance	1,336
A	Hayti Herald-Enterprise	1,315
C	Salem Special	1,293
D	Miner County Pioneer (Howard)	1,280
A	Platte Enterprise	1,251
B	Parker New Era	1,250
D	Highmore Herald	1,196
A	Groton Independent	1,194
B	Watertown Photo News	1,190
C	Queen City Mail (Spearfish)	1,185
A	Buffalo Times-Herald	1,170
B	Garretson News	1,151
C	Lake Preston Times	1,116
D	Marion Record	1,115
B	Wagner Post	1,115
C	Faulkton Record	1,102
D	Brule County News (Kimball)	1,073
A	Woonsocket News[2]	1,055
C	Ipswich Tribune[3]	1,048
D	Centerville Journal	1,025
A	Lemmon Tribune	1,025
B	Bison Courier	1,023
D	Selby Record[4]	1,008
A	Arlington Sun	1,005
B	Onida Watchman	1,003
C	Corsica Globe	990
A	Lake Andes Wave	950
B	Alexandria Herald	947
C	Pollock Pioneer	905
D	Rosholt Review	905
B	Alcester Union	901
C	Bowdle Pioneer	875
D	Lyman County Herald (Presho)	860
A	Herried Prairie Picayune	853

C	Tripp Ledger	852
D	McLaughlin Messenger	850
A	Wilmot Enterprise	848
B	Valley Irrigator (Newell)	832
D	Leola Herald	830
A	Hutchinson Herald (Menno)	830
B	Armour Chronicle	807
C	Irene Tri-County News	780
A	Hoven Review	760
B	Canistota Clipper	753
C	Kadoka Press	750
D	Plankinton South Dakota Mail	750
B	Timber Lake Topic	740
C	Wakonda Monitor	740
D	Edgemont Tribune	733
A	White Ledger	732
C	Bonesteel Enterprise	725
D	Dupree West River Progress	725
A	Brown County News (Frederick)	720
B	Springfield Times	704
D	Murdo Coyote	700
A	Charles Mix County News (Geddes)	695
B	Volga Tribune	653
C	Davison County Tribune (Mitchell)	651
A	Canova Herald	649
B	Reville Weekly Item	648
C	Viborg Enterprise	646
D	Burke Gazette	645
B	Elkton Record	635
C	Humboldt Journal	631
D	Stickney Argus[5]	625
A	Kennebec Advocate-Leader	614
C	Bridgewater Tribune	608
D	Faith Independent	601
A	Doland Times-Record	600
B	Hurley Leader	600
D	Corson County News (McIntosh)[6]	600
A	Carthage News	594
B	Estelline Journal	590
C	Wessington Times-Enterprise	582

A	Todd County News (Mission)	578
B	Isabel Dakotan	575
C	Emery Enterprise	554
D	Hamlin County News (Bryant)	528
B	Hudson Hudsonite	525
C	Colton Courier	523
D	Delmont Record	521
A	Mount Vernon News	521
C	South Shore Gazette	514
D	Bristol New Era	506
A	Conde News	500
B	Wall Courant	500
D	Montrose Herald	496
A	Hartford News	495
B	Black Hills Press (Sturgis)	489
C	Waubay Clipper	486
A	Wolsey News	475
B	Hamlin County Republican (Castlewood)	471
C	Langford Bugle	465
D	Melette County News (White River)	465
B	Eagle Butte News	460
C	Gary Interstate	460
D	Hecla Journal	453
A	Harrold Journal	452
C	Toronto Herald	425
D	Cresbard Beacon	399
A	Alpena Journal	380
B	Colman Argus	380
D	Wood Pioneer	379
A	Henry Independent	350
B	Gann Valley Chief	323
C	Black Hills Weekly (Deadwood)	314
A	Quinn Record	245
B	Jones County Tribune (Draper)	240
C	Ree Heights Review	225
D	Pukwana Press-Reporter	220

The following newspapers are operated under joint ownership with newspapers already listed. It was assumed that editorial judgment would be similar in both newspapers under one publisher. Therefore, the smaller newspaper of each paid was omitted from this study.

[1]Winner Journal	352	Winner Advocate	Group C
[2]Artesian Commonwealth	315	Woonsocket News	Group A
[3]Roscoe Independent	671	Ipswich Tribune	Group C
[4]Java Herald	312	Selby Record	Group D
[5]Aurora County Standard	498	Stickney Argus	Group D
[6]Morristown World	210	Corson County News	Group D

APPENDIX II. NEWS RELEASE AND ILLUSTRATION USED FOR FIRST MAILING

Protect Seedling Tree Roots From Freezing in Storage (Story and illustration)[1]

Brookings, S. D., Jan ___: Protect your investment in tree seedlings by preventing their roots from freezing before you plant them this spring.

This is vital because even hardy species will not survive if their roots are exposed to freezing temperatures too long, according to Paul E. Collins, associate forester for the Agricultural Experiment Station at South Dakota State College. And it's a waste of time and money if the seedlings you plant do not survive.

You should not transport any tree stock when temperatures are at or below freezing unless you take special steps to protect their roots. "If you cannot heel in trees as soon as you get them to their destination, fully protect them from freezing temperatures by putting them in a heated building or basement until they can be heeled in," Collins continues.

This advice comes as a result of an Experiment Station project now underway. The study was started because of low survival in the state's windbreak program in 1956. Even Chinkota elm, a hardy strain of Siberian elm developed by the Experiment Station, was affected.

Researchers found that seedlings were in good condition at the nursery, Collins states. Field workers reported that stock was good and had live, green stems. However, a few noticed roots were moldy and some plants leafed out and then died, suggesting root injury.

"We checked temperature conditions on days seedling stock was picked up at the nursery and found there was definitely a chance for root freezing," says Collins.

Boxelder, American plum, green ash, American elm, Siberian elm, and Chinkota elm were then tested for effects of root freezing. Seedlings were exposed to three temperatures for different lengths of time.

"At the coldest temperature setting, 19 to 27 degrees F., practically all the seedlings were killed outright," Collins concludes.

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CUTLINE: Here's what freezing can do to a seedling tree's root system. Paul E. Collins, associate forester, South Dakota Agricultural Experiment Station, points out the complete lack of a root system on the frozen seedling (left) compared to a normal seedling. To insure good survival in a farm planting, Collins emphasizes the need for protecting tree roots from freezing.[1]

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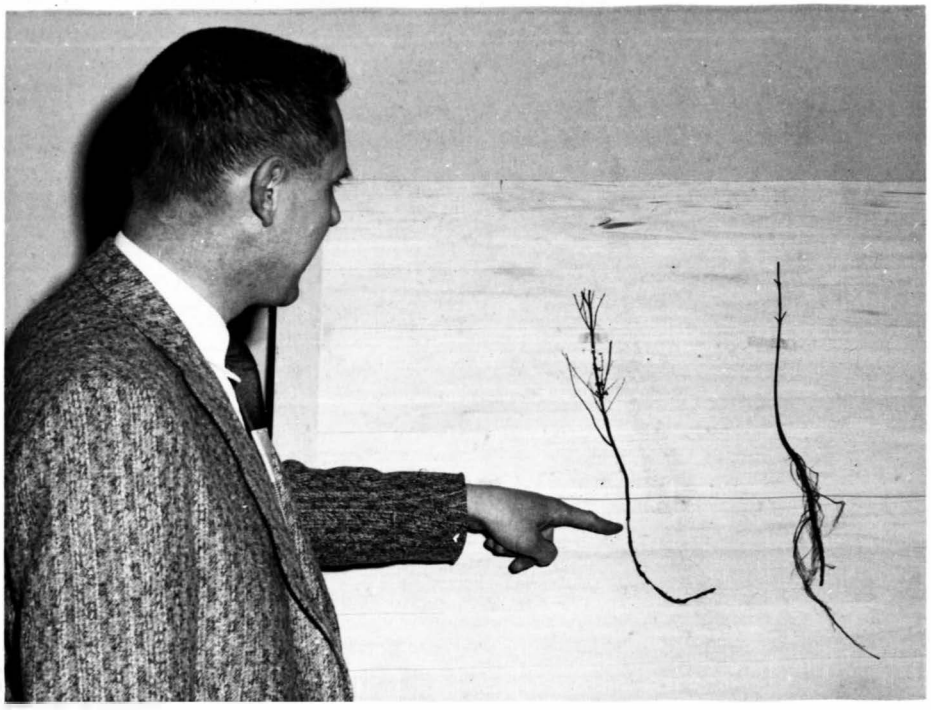
[1]Omitted in release sent without illustrative material.



APPENDIX III. NEWS RELEASE AND ILLUSTRATION USED FOR SECOND MAILING

Steer Gains 4.33 Pounds Daily in SDSC Trial (Story and illustration)[1]

A steer at South Dakota State College made an average daily gain of 4.33 pounds, about double the state average, during a recently completed 160-day feeding experiment.

The steer, shown above[1], weighed 1,405 pounds at slaughter as a long yearling. He dressed 63.8 percent, graded high choice, sold for $30.40 a hundredweight, and brought a total of $427.12, according to L. B. Embry, animal husbandman, and Paul R. Zimmer, graduate assistant, of the Agricultural Experiment Station at State College, who conducted the experiment.

This steer was one of a lot fed "Dynafac," a new chemobiotic feed additive being tested at the station. Embry and Zimmer point out that although this steer made an unusually large rate of gain, the average gain made by the lot was also exceptionally high for a 160-day feeding trial. The 12 steers averaged 3.1 pounds a day and sold for $29.51 a hundredweight while another lot, fed the same ration without "Dynafac," averaged 2.79 pounds a day and sold for $28.15 a hundredweight.

The basic ration for both lots consisted of 67.5 percent rolled corn, 20 percent ground alfalfa, 10 percent soybean meal, 1 percent bone meal, and 1.5 percent trace mineralized sale, self-fed. All steers in both lots were also implanted with stilbestrol.

"Dynafac" is rather new as a feed additive, the scientists point

out. It is produced chemically, has anti-bacterial properties, is a surface-active agent and has appeared to be beneficial in preventing feed-lot bloat. Further trials to test the additive in self-fed, high concentrated rations are being planned, say Embry and Zimmer. Armour and Company, manufacturers of "Dynafac," have given the Experiment Station a $6,000 grant-in-aid for more research on the project.

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[1]Omitted in release sent without illustrative material.

APPENDIX IV. FORMULAE USED IN STATISTICAL ANALYSES*

The investigation contained four treatments, A, B, C, and D, where:

A = No illustrative material
B = Photographs
C = Plastic engravings
D = Mats

The following diagram illustrates the design in which the treatments are arranged in the investigation:

Grouping of Newspapers

	(1)	(2)	(3)	(4)
News Release No. 1	A (1)	B (2)	C (3)	D (4)
News Release No. 2	C (5)	D (7)	A (6)	B (5)

37 Newspapers per group

If groups of newspapers are assumed to show no significance variation in their response to treatments, the breakdown of the total degrees of freedom is:

Source of variation	Degree of Freedom (df)	Sum of Squares (ss)	Mean Squares (ms)
Among 2 News Releases	1	RSS	R= RSS/1
Among 4 Treatments	3	TSS	T= TSS/3
Remainder or Error	3	ESS	E= ESS/3
Total	7	SS	

*The formulae presented in this Appendix were prepared by Dr. Robert Bell, Economics Department, South Dakota State College.

The results of the investigation appear as:

Treatments	News release 1	2	Totals	Means
A	A_1	A_2	A_t	$A_t/2 = \bar{X}_A$
B	B_1	B_2	B_t	$\bar{X}_B$
C	C_1	C_2	C_t	$\bar{X}_C$
D	D_1	D_2	D_t	$\bar{X}_D$
Total	T_1	T_2	T_t	$\bar{X}$

The analyses and computations are:

1. Correction term for the mean--$T^2/8$

2. Total Sums of Squares corrected for the mean--$(A_1^2+A_2^2+B_1^2+B_2^2+C_1^2+C_2^2+D_1^2+D_2^2)--T^2/8 = SS$

3. The News Release Sum of Squares-- $\left(\frac{T_1^2 + T_2^2}{4}\right)$ -- $T^2/8 = RSS$

4. The Treatment Sum of Squares-- $\left(\frac{A_t^2 + B_t^2 + C_t^2 + D_t^2}{2}\right)$ -- $T^2/8 = TSS$

In this study, a test of the hypothesis of no difference among the treatment means will probably not be as important as a test of the difference between two treatment means or a multiple comparison test for a group of ranked means.

The standard error of the mean difference between two treatments is:

$$s_{\bar{x}_i - \bar{x}_j} = \sqrt{2\left(\frac{ESS}{3}\right)/2} = \sqrt{2\,\frac{ESS}{6}} = \sqrt{\frac{ESS}{3}}$$

The least significant difference is:

$$lsd = s_{\bar{x}_i - \bar{x}_j}\, t_{05} \quad (3df) = \sqrt{\frac{ESS}{3}\quad (3.182)} = 3.182\,\sqrt{\frac{ESS}{3}}$$

By comparing all differences of treatment means with the lsd, we may say that those differences which exceed the lsd come from populations with different means.

APPENDIX V. SUMMARY OF USAGE OF TEST RELEASES, BY NEWSPAPER AND GROUP

	City and Newspaper	Circulation	Illus. Yes	Illus. No	Inches Illus.	Inches Copy	Inches Total
	No Illustrative Material						
First Release	Gregory Times-Advocate	1,737		x*	---	8½	8½
	Groton Independent	1,194		x*	---	9	9
	Woonsocket News	1,055		x*	---	9½	9½
	Clear Lake Courier	1,665		x*	---	7	7
Second Release	Ft. Pierre Times	1,380		x*	---	10	10
	Bowdle Pioneer	875		x*	---	8	8
	Ree Heights Review	225		x*	---	9	9
	Totals	8,131			---	61	61
	Photographs						
	Newell Valley Irrigator	832		x	---	8½	8½
	Miner County Pioneer (Howard)	1,280	x		6	6	12
	Delmont Record	521		x	---	7	7
	Hecla Independent	453	x		6	8	14
	Totals	3,086			12	29½	41½
	Mats						
	Marion Record	1,115	x		7	1½#	8½
	Edgemont Tribune	733	x		7	7	14
	Burke Gazette	645	x		7	1½#	8½
	Delmont Record	521	x		7	7	14
	Wagner Post	1,115	x		6	8	14
	Onida Watchman	1,003	x		6	8	14
	Armour Chronical	807	x		6	9	15
	Estelline Journal	590	x		6	7	13
	Wall Courant	500	x		6	7	13
	Totals	7,029			58	56	114
	Engravings						
	Winner Advocate	3,185		x	---	8½	8½
	Mobridge Tribune	2,844	x		7	9½	16½
	Milbank Herald Advance	2,450	x		7	10	17
	Clear Lake Courier	1,665	x		7	10½	17½
	Lennox Independent	1,475	x		7	12	19
	Scotland Journal	1,438	x		7	10½	17½
	Ft. Pierre Times	1,380	x		7	13	20

SUMMARY OF USAGE OF TEST RELEASES BY NEWSPAPER AND GROUP
(Continued)

City and Newspaper	Circulation	Illus. Yes	Illus. No	Inches Illus.	Inches Copy	Inches Total
Salem Special	1,293	x		7	10½	17½
Faulkton Record	1,102	x		7	11	18
Tripp Ledger	852	x		7	11½	18½
Davison Co. Tribune (Mitchell)	651	x		7	8	15
Wessington Times-Enterprise	582	x		7	11½	18½
Gary Interstate	460	x		7	9	16
Toronto Herald	425	x		7	10½	17½
Ree Heights Review	225	x		7	12	19
Brookings Register	4,039	x		6	12	18
Grant Co. Review (Milbank)	2,635	x		6	8	14
Britton Journal	1,992	x		6	8	14
Gregory Times-Advocate	1,737	x		6	8	14
Gate City Guide (Rapid City)	1,629	x		6	7	13
Bennett Co. Booster II (Martin)	1,514	x		6	8	14
Hayti Herald Enterprise	1,315	x		6	8	14
Platte Enterprise	1,251	x		6	8	14
Groton Independent	1,194	x		6	9	15
Buffalo Times-Herald	1,170	x		6	9	15
Lemmon Tribune	1,025	x		6	8	14
Arlington Sun	1,005	x		6	6	12
Hutchinson Herald (Menno)	830	x		6	8½	14½
Hoven Review	760	x		6	8	14
Brown Co. News (Frederick)	720	x		6	8	14
Charles Mix Co. News (Geddes)	695	x		5	10	15
Carthage News	594	x		6	7½	13½
Mt. Vernon News	521	x		6	9	15
Totals	44,653			205	308	513

*Received no illustrative material.
#Used mat and cutline only.